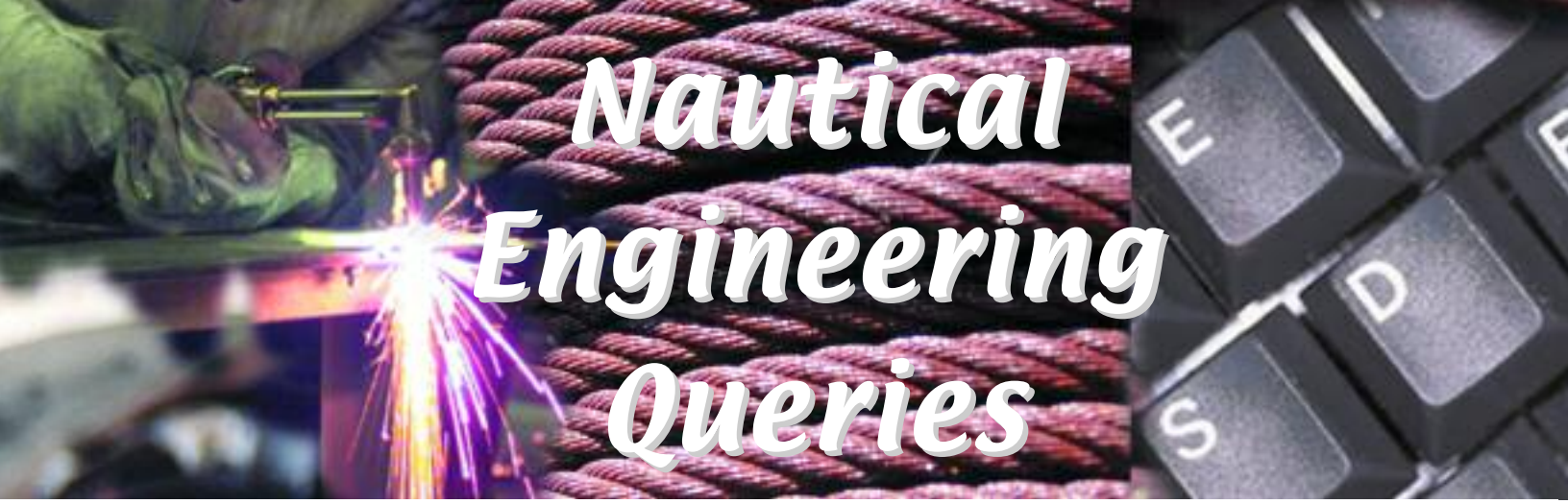


Nautical Engineering Queries

1. The ignition quality of diesel fuel becomes less critical as _____.

Note: Ignition quality is the ability of a fuel to ignite when it is injected into the compressed-air charge in the diesel engine cylinder. A fuel with a good ignition quality ignites readily, with a minor ignition delay resulting in a smoother running engine with less noise and vibration. A fuel with a poor ignition quality will be delayed in its ability to ignite. The ignition quality of a fuel affects the ease of starting the engine and its performance.

A. the amount of lube oil additives increase
Incorrect: Lube oil additives only provide for specific operational improvements of the lube oil to reduce friction while the engine is in operation. Additives such as foam inhibitors, detergents, viscosity index improvers and TBN additives that neutralize acid formation have no effect on the actual combustion characteristics of the fuel during normal engine operation.

B. piston speeds increase
Incorrect: Since piston speed is a function of piston stroke and engine RPM, an increase in piston speed will result from an increase in engine speed. This will decrease the available period for total combustion during the power stroke, thereby becoming a critical factor and requiring a high quality fuel with a rapid ignition characteristic.

C. injection pressures decrease
Incorrect: Low quality fuels require higher preheat temperatures to reduce viscosity, which, if not provided, would result in higher injection pressure in order to properly atomize and mix the fuel charge with combustion air for complete combustion.

D. engine speeds decrease
Correct Answer: A decrease in engine speed provides an increase in the period of time available for total combustion of the fuel during the power stroke and provides additional time to compensate for ignition delay when using low quality fuels.

---

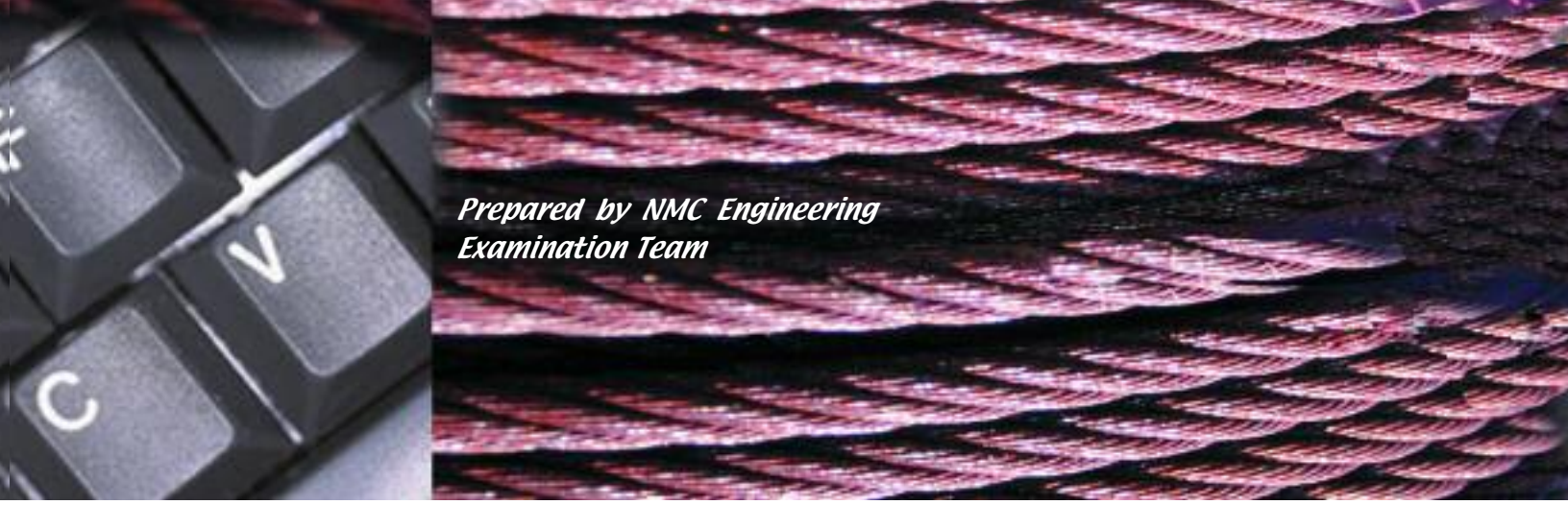
2. Which of the following statements is TRUE concerning lifejackets?

A. Buoyant vests may be substituted for lifejackets.
Incorrect: A life preserver is designed and constructed with material and workmanship to perform its intended function in all weather conditions. Buoyant vests are designed for use only under ideal conditions and are not substitutes for lifejackets nor are they required to meet minimum life preserver requirements.

B. Kapok lifejackets must have plastic-covered pad inserts.
Correct Answer: Kapok pad inserts are to be covered with a flexible vinyl film not less than 0.006 inches in thickness as cited by 46 CFR Part160.002-3(d).

C. Lifejackets must always be worn with the same side facing outwards.
Incorrect: Lifejackets are designed to be donned correctly without prior demonstration, instructions, or assistance by at least 75% of the persons unfamiliar with the design. To meet this specification, it is required that the lifejacket is capable of being worn inside out.

D. Lifejackets are not designed to turn a person's face clear of the water when unconscious.
Incorrect: Lifejackets are designed to support the wearer in the water in an upright or slightly backward position, and are to provide support to the head so that the face of an unconscious or exhausted person is held above the water.



3. The opposition to the establishment of magnetic lines of force in a magnetic circuit is called the circuit's _____.

A. resistance
Incorrect Answer: Resistance is the opposition to current flow through the components of a circuit.

B. reluctance
Correct Answer: The strength of magnetic flux is partly determined by the permeability of the material being magnetized. Reluctance is inversely proportional to permeability. As an example, iron has high permeability and low reluctance while an air gap has low permeability and high reluctance. Generator and motor magnetic circuits are designed with minimum air gaps to minimize losses due to reluctance and maximize magnetic flux strength.

C. impedance
Incorrect: Impedance is the total resistance of an AC circuit and its components including inductive and capacitive reactance.

D. inductance
Incorrect: Inductance is the characteristic of an AC circuit, which causes a delay in the change of magnitude of current flow due to the effects of a generated magnetic field produced in the circuit.

---

4. A vessel, which is subjected to "hogging", has its _____.

A. main deck under compressive stress
Incorrect: When the main deck plating encounters compressive stresses, the vessel is said to be in a condition known as "sagging." This occurs when the vessel is supported mainly by wave crests at the bow and stern.

B. main deck plating under tensile stress
Correct Answer: When the main deck plating of a vessel is encountering tensile stresses, the vessel is said to be in a condition of "hogging." This condition is most pronounced when the buoyant force of a wave is midship to the vessel, resulting in the bow and stern deflecting downward.

C. bottom plate under shearing stress
Incorrect: Shearing stress is the tendency of one part of a body to slide over another part. This condition causes materials to be cut or sliced.

D. bottom and deck plating under compressive stress
Incorrect: A "hogging" condition will cause only the bottom hull plating to be under compressive stresses, while, at the same instant, the main deck will be under tensile stress. A ship's hull is essentially a hollow box beam, and, when at rest, neither tensile nor compressive stresses are present.